What Is Claimed Is:

1. A method for processing a thin film sample, comprising the steps of:

(a) controlling a beam generator to emit at least one beam pulse;

(b) with the at least one beam pulse, irradiating at least one portion of the film sample with sufficient intensity to fully melt the at least one section of the sample throughout its thickness; and

(c) allowing the at least one portion of the film sample to re-solidify, the re-solidified at least one portion being composed of a first area and a second area, wherein, upon the re-solidification thereof, the first area includes large grains, and the second area has a small-grained region formed through nucleation,

wherein the first area surrounds the second area and has a grain structure which is different from a grain structure of the second area, and wherein the second area is configured to facilitate thereon an active region of an electronic device.

2. The method according to claim 1,

wherein the first area has a first border and a second border which is provided opposite and parallel to the first border of the first area,

wherein the second area has a third border and a fourth border which is provided opposite and parallel to the third border of the second area, and

wherein a distance between the first border and the second border is smaller than a distance between the third border and the fourth border.

3. The method according to claim 2, wherein the second area corresponds to at least one pixel.

4. The method according to claim 1, wherein the second area has a cross-section for facilitating thereon all portions of the electronic device.

5. The method according to claim 1, wherein a size and a position of the first area with respect to the second area are provided such that the first area provides either no effect or a negligible effect on a performance of the electronic device.

6. The method according to claim 1, further comprising the steps of:

(d) translating the thin film sample for a predetermined distance;

(e) with a further beam pulse, irradiating a further portion of the film sample, wherein the further portion is provided at a distance from the at least one portion that substantially corresponds to the predetermined distance; and

(f) allowing the further portion of the film sample to re-solidify, the re-solidified at least one portion being composed of a third area and a fourth area,

wherein the third area surrounds the fourth area, and wherein at least one section of the third area at least partially overlaps at least one section of the first area, and

wherein, upon the re-solidification thereof, the third area has laterally grown grains, and the fourth area has a nucleated region.

7. The method according to claim 6, wherein the fourth area is composed of edges which are provided away from edges of the second area.

8. The method according to claim 6, wherein the fourth area is composed of edges which approximately border edges of the second area, and wherein the edges of the fourth area do not extend into any section of the first area.

9. The method according to claim 6, wherein the at least one beam pulse has a fluence which is substantially the same as a fluence of the further beam pulse.

10. The method according to claim 6, wherein the at least one beam pulse has a fluence which is different from a fluence of the further beam pulse.

11. The method according to claim 1, further comprising the steps of:

(g) translating the thin film sample for a predetermined distance; and

(h) irradiating a further portion of the film sample using at least one beam pulse, wherein the further portion is provided at a distance from the at least one portion that substantially corresponds to the predetermined distance, and wherein steps (d) and (e) are provided to control a width of the first area.

12. The method according to claim 1, wherein the film sample is one of a pre-patterned silicon thin film sample and a continuous silicon thin film sample.

13. The method according to claim 1, wherein the electronic device is a thin film transistor.

14. The method according to claim 1, further comprising the steps of:

(i) translating the thin film sample for a predetermined distance;

(j) irradiating a further portion of the film sample using at least one beam pulse, wherein the further portion is provided at a distance from the at least one portion that substantially corresponds to the predetermined distance; and

(k) repeating steps (i) and (j) for additional portions of the film sample without stopping the translation of the film sample after the completion of the repeated step (j).

15. The method according to claim 14, wherein step (i) delivers the film sample to a first relative pre-calculated position of the further portion of the film sample to be irradiated, and wherein, after step (k), the film sample is provided at a second relative pre-calculated position whose distance is different from the predetermined distance.

16. The method according to claim 1, further comprising the steps of:

(l) translating the thin film sample for a predetermined distance;

(m) stopping the translation of the film sample, and allowing vibrations of the film sample to settle; and

(n) after step (m), irradiating a further portion of the thin film using at least one beam pulse, wherein the further portion is provided at a distance from the at least one portion that substantially corresponds to the predetermined distance.

17. The method according to claim 1, further comprising the steps of:

(o) after step (c), irradiating the at least one portion of the film sample with a further beam pulse; and

(p) after step (o), allowing the at least one portion of the film sample to re-solidify.

18. The method according to claim 17, wherein a fluence of the at least one beam pulse is different from a fluence of the further beam pulse.

19. The method according to claim 18, wherein the fluence of the further beam pulse is less than the fluence of the at least one beam pulse.

20. The method according to claim 1, further comprising the step of:

(a) after step (c), determining a location of the first area so as to avoid a placement of the active region of the electronic device thereon.

21. The method according to claim 1, wherein the at least one beam pulse includes a plurality of beamlets, and wherein the first and second areas are irradiated by the beamlets.

22. The method according to claim 1, wherein the film sample is one of a silicon thin film sample and a metal thin film sample.

23. The method according to claim 1, wherein the thin film sample is composed of at least one of silicon, germanium, and a compound of silicon germanium.

24. The method according to claim 1, wherein the thin film has a thickness approximately between 100Å and 10,000Å.

25. The method according to claim 1, further comprising the step of:

(r) before step (b), masking portions of the at least one beam pulse to produce at least one masked beam pulse, wherein the at least one masked beam pulse is used to irradiate the at least one portion of the film sample in step (b).

26. The method according to claim 1, wherein the large grains provided in the first area are laterally-grown grains.

27. The method according to claim 26, wherein the laterally-grown grains of the first area are equiaxed grains.

28. A method for processing a thin film sample, comprising the steps of:

(a) controlling a beam generator to emit at least one beam pulse;

(b) with the at least one beam pulse, irradiating at least one portion of the film sample with an intensity that is sufficient to fully melt at least one section of the film sample throughout its thickness, the at least one beam pulse having a predetermined shape;

(c) allowing the at least one portion of the film sample to re-solidify, the re-solidified at least one portion being composed of a first area and a second area, wherein the first area surrounds the second area, and wherein, upon the re-solidification thereof, the first area has large grains, and the second area has a small-grained region formed through nucleation;

(d) translating the thin film sample for a predetermined distance; and

(e) irradiating a further portion of the thin film using a further beam pulse, wherein the further portion is provided at a distance from the at least one portion that substantially corresponds to the predetermined distance, wherein steps (b) though (e) are provided to control a width of the first area, and wherein the second area has a

cross-section to allow an active region of an electronic device to be facilitated thereon.

29. The method according to claim 28, wherein the second area corresponds to at least one pixel.

30. The method according to claim 28,

wherein the first area has a first border and a second border which is provided opposite and parallel to the first border of the first area,

wherein the second area has a third border and a fourth border which is provided opposite and parallel to the third border of the second area, and

wherein a distance between the first border and the second border is smaller than a distance between the third border and the fourth border.

31. The method according to claim 28, wherein the second area has a cross-section for facilitating thereon all portions of the electronic device.

32. The method according to claim 28, wherein a size and a position of the first area with respect to the second area are provided such that the first area provides either no effect or a negligible effect on a performance of the electronic device.

33. The method according to claim 28, further comprising the steps of:

(f) after step (e), allowing the further portion of the film sample to re-solidify, the re-solidified at least one portion being composed of a third area and a fourth area,

wherein the third area surrounds the fourth area, and wherein at least one section of the third area at least partially overlaps at least one section of the first area, and

wherein, upon the re-solidification thereof, the third area has laterally grown grains, and the fourth area has a nucleated region.

34. The method according to claim 33, wherein the fourth area is composed of edges which are provided away from edges of the second area.

35. The method according to claim 33, wherein the fourth area is composed of edges which approximately border edges of the second area, and wherein the edges of the fourth area do not extend into any section of the first area.

36. The method according to claim 28, wherein the at least one beam pulse has a fluence which is substantially the same as a fluence of the further beam pulse.

37. The method according to claim 28, wherein the at least one beam pulse has a fluence which is different from a fluence of the further beam pulse.

38. The method according to claim 28, wherein the film sample is one of a pre-patterned silicon thin film sample and a continuous silicon thin film sample.

39. The method according to claim 28, wherein the electronic device is a thin film transistor.

40. The method according to claim 28, further comprising the steps of:

(g) repeating steps (d) and (e) on additional portions of the film sample without stopping the translation of the film sample.

41. The method according to claim 40, wherein step (d) delivers the film sample to a first relative pre-calculated position of the further portion of the film sample to be irradiated, and wherein, after step (e), the film sample is provided at a second relative pre-calculated position whose distance is different from the predetermined distance.

42. The method according to claim 28, further comprising the steps of:

(h) after step (d), stopping the translation of the film sample, and allowing vibrations of the film sample to settle; and

(i) after step (h), irradiating a further portion of the thin film using at least one beam pulse, wherein the further portion is provided at a distance from the at least one portion that substantially corresponds to the predetermined distance.

43. The method according to claim 42, wherein a fluence of the at least one beam pulse is different from a fluence of the further beam pulse.

44. The method according to claim 43, wherein the fluence of the further beam pulse is less than the fluence of the at least one beam pulse.

45. The method according to claim 28, wherein the at least one beam pulse includes a plurality of beamlets, and wherein the first and second areas are irradiated by the beamlets.

46. The method according to claim 28, wherein the film sample is one of a silicon thin film sample and a metal thin film sample.

47. The method according to claim 28, wherein the thin film sample is composed of at least one of silicon, germanium, and a compound of silicon germanium.

48. The method according to claim 28, wherein the thin film has a thickness approximately between 100Å and 10,000Å.

49. The method according to claim 28, further comprising the step of:

(j) before step (b), masking portions of the at least one beam pulse to produce at least one masked beam pulse, wherein the at least one masked beam pulse is used to irradiate the at least one portion of the film sample in step (b).

50. The method according to claim 28, wherein the large grains provided in the first area are laterally-grown grains.

51. The method according to claim 50, wherein the laterally-grown grains of the first area are equaled grains.

52. A system for processing a thin film sample, comprising:

a processing arrangement which is configured to:

(a) control a beam generator to emit at least one beam pulse which is sufficient to fully melt at least one section of the film sample throughout its thickness,

(b) control a translation stage such that at least one portion of the film sample is irradiated with the at least one beam pulse, the at least one beam pulse having a predetermined cross section,

wherein the at least one portion of the film sample is allowed to re-solidify, the re-solidified at least one portion being composed of a first area and a second area,

wherein, upon the re-solidification thereof, the first area has large grains, and the second area has a small-grained region formed through nucleation,

wherein the first area surrounds the second area and has a grain structure which is different from a grain structure of the second area, and

wherein the second area is configured to facilitate thereon an active region of an electronic device.

53. The system according to claim 52, wherein the second area corresponds to at least one pixel.

54. The system according to claim 52,

wherein the first area has a first border and a second border which is provided opposite and parallel to the first border of the first area,

wherein the second area has a third border and a fourth border which is provided opposite and parallel to the third border of the second area, and

wherein a distance between the first border and the second border is smaller than a distance between the third border and the fourth border.

55. The system according to claim 52, wherein the second area has a cross-section for facilitating thereon all portions of the electronic device.

56. The system according to claim 52, wherein a size and a position of the first area with respect to the second area are provided such that the first area provides either no effect or a negligible effect on a performance of the electronic device.

57. The system according to claim 52, wherein the processing arrangement is further configured to:

(c) control the translation stage to translate the thin film sample for a predetermined distance, and

(d) control the laser beam generator to irradiating a further portion of the film sample with a further beam pulse, the further portion being provided at a distance from the at least one portion that substantially corresponds to the predetermined distance,

wherein the further portion of the film sample is allowed to re-solidify, the re-solidified at least one portion being composed of a third area and a fourth area,

wherein the third area surrounds the fourth area, and wherein at least one section of the third area at least partially overlaps at least one section of the first area, and

wherein, upon the re-solidification thereof, the third area has laterally grown grains, and the fourth area has a nucleated region.

58. The system according to claim 57, wherein the fourth area is composed of edges which are provided away from edges of the second area.

59. The system according to claim 57, wherein the fourth area is composed of edges which approximately border edges of the second area, and wherein the edges of the fourth area do not extend into any section of the first area.

60. The system according to claim 52, wherein the at least one beam pulse has a fluence which is substantially the same as a fluence of the further beam pulse.

61. The system according to claim 52, wherein the at least one beam pulse has a fluence which is different from a fluence of the further beam pulse.

62. The system according to claim 52, wherein the processing arrangement is further configured to:

(e) control the translation stage to translate the thin film sample for a predetermined distance, and

(f) control the laser beam generator to irradiate a further portion of the film sample using at least one beam pulse, wherein the further portion is provided at a distance from the at least one portion that substantially corresponds to the predetermined distance, and wherein the processing arrangement irradiates the at least one portion and allows the at least one portion to re-solidify to control a width of the first area.

63. The system according to claim 52, wherein the film sample is one of a pre-patterned silicon thin film sample and a continuous silicon thin film sample.

64. The system according to claim 52, wherein the electronic device is a thin film transistor.

65. The system according to claim 52, wherein the processing arrangement is further configured to:

(g) control the translation stage to translate the thin film sample for a predetermined distance,

(h) control the laser beam generator to irradiate a further portion of the film sample using at least one beam pulse, wherein the further portion is provided at a distance from the at least one portion that substantially corresponds to the predetermined distance; and

(i) repeat procedures (g) and (h) for additional portions of the film sample without stopping the translation of the film sample after the completion of the repeated procedure (i).

66. The system according to claim 65, wherein the processing arrangement performs procedure (g) to deliver the film sample to a first relative pre-calculated position of the further portion of the film sample to be irradiated, and wherein, after the processing arrangement performs procedure (i), the film sample is provided at a second relative pre-calculated position whose distance is different from the predetermined distance.

67. The system according to claim 52, wherein the processing arrangement is further configured to:

(j) control the translation stage to translate the thin film sample for a predetermined distance, stop the translation of the film sample, and allow vibrations of the film sample to settle, and

(k) after procedure (j), control the laser beam generator to irradiate a further portion of the thin film using at least one beam pulse, wherein the further portion is provided at a distance from the at least one portion that substantially corresponds to the predetermined distance.

68. The system according to claim 52, wherein the processing arrangement is further configured to:

(l) after procedure (b), control the laser beam generator to irradiate the at least one portion of the film sample with a further beam pulse, and

(m) after procedure (l), allow the at least one portion of the film sample to re-solidify.

69. The system according to claim 58, wherein a fluence of the at least one beam pulse is different from a fluence of the further beam pulse.

70. The system according to claim 69, wherein the fluence of the further beam pulse is less than the fluence of the at least one beam pulse.

71. The system according to claim 52, wherein the at least one beam pulse includes a plurality of beamlets, and wherein the first and second areas are irradiated by the beamlets.

72. The system according to claim 52, wherein the film sample is one of a silicon thin film sample and a metal thin film sample.

73. The system according to claim 52, wherein the thin film sample is composed of at least one of silicon, germanium, and a compound of silicon germanium.

74. The system according to claim 52, wherein the thin film has a thickness approximately between 100Å and 10,000Å.

75. The system according to claim 52, wherein the processing arrangement is further configured to:

(l) during procedure (b), mask portions of the at least one beam pulse to produce at least one masked beam pulse, wherein the at least one masked beam pulse is used to irradiate the at least one portion of the film sample in procedure (b).

76. The system according to claim 52, wherein the large grains provided in the first area are laterally-grown grains.

77. The system according to claim 76, wherein the laterally-grown grains of the first area are equiaxed grains.

78. A system for processing a thin film sample, comprising:

a processing arrangement which is configured to:

(a) control a beam generator to emit at least one beam pulse which has an intensity which is sufficient to fully melt at least one section of the film sample throughout its entire thickness,

(b) control a translation stage such that at least one portion of the film sample is irradiated with the at least one beam pulse, the at least one beam pulse having a predetermined cross section, wherein the at least one portion of the film sample is allowed to re-solidify, the re-solidified at least one position being composed of a first area and a second area, and wherein, upon the re-solidification thereof, the first area has large grains, and the second area has a small-grained region formed through nucleation,

(c) control the translation stage to translate the thin film sample for a predetermined distance, and

(d) control the laser beam generator to irradiate a further portion of the thin film using a further beam pulse, the further portion being provided at a distance from the at least one portion that substantially corresponds to the predetermined distance,

wherein procedures (b) through (d) are provided to control a width of the first area, and

wherein a width of the second area is configured to facilitate thereon an active region of an electronic device.

79. The system according to claim 78, wherein the second area corresponds to at least one pixel.

80. The system according to claim 78,

wherein the first area has a first border and a second border which is provided opposite and parallel to the first border of the first area,

wherein the second area has a third border and a fourth border which is provided opposite and parallel to the third border of the second area, and

wherein a distance between the first border and the second border is smaller than a distance between the third border and the fourth border.

81. The system according to claim 80, wherein, upon the re-solidification of the film sample, a nucleated region is formed in the second area.

82. The system according to claim 78, wherein the second area has a cross-section for facilitating thereon all portions of the electronic device.

83. The system according to claim 78, wherein a size and a position of the first area with respect to the second area are provided such that the first area provides either no effect or a negligible effect on a performance of the electronic device.

84. The system according to claim 78,

wherein the further portion of the film sample is allowed to re-solidify, the re-solidified at least one portion being composed of a third area and a fourth area, and wherein the third area surrounds the fourth area,

wherein at least one section of the third area at least partially overlaps at least one section of the first area, and

wherein, upon the re-solidification thereof, the third area has laterally grown grains, and the fourth area has a nucleated region.

85. The system according to claim 84, wherein the fourth area is composed of edges which are provided away from edges of the second area.

86. The system according to claim 84, wherein the fourth area is composed of edges which approximately border edges of the second area, and wherein the edges of the fourth area do not extend into any section of the first area.

87. The system according to claim 78, wherein the at least one beam pulse has a fluence which is substantially the same as a fluence of the further beam pulse.

88. The system according to claim 78, wherein the at least one beam pulse has a fluence which is different from a fluence of the further beam pulse.

89. The system according to claim 78, wherein the film sample is one of a pre-patterned silicon thin film sample and a continuous silicon thin film sample.

64. The system according to claim 78, wherein the electronic device is a thin film transistor.

91. The system according to claim 78, wherein the processing arrangement is further configured to:

(e) repeat procedures (c) and (d) on additional portions of the film sample without stopping the translation of the film sample.

92. The system according to claim 89, wherein procedure (c) delivers the film sample to a first relative pre-calculated position of the further portion of the film sample to be irradiated, and wherein, after procedure (d), the film sample is provided at a second relative pre-calculated position whose distance is different from the predetermined distance.

93. The system according to claim 78, wherein the processing arrangement is further configured to:

(f) after procedure (e), control the translation stage to stop the translation of the film sample, and allow vibrations of the film sample to settle, and

(g) after procedure (f), control the laser beam generator to irradiate a further portion of the thin film using at least one beam pulse, wherein the further portion is provided at a distance from the at least one portion that substantially corresponds to the predetermined distance.

94. The system according to claim 93, wherein a fluence of the at least one beam pulse is different from a fluence of the further beam pulse.

95. The system according to claim 93, wherein the fluence of the further beam pulse is less than the fluence of the at least one beam pulse.

96. The system according to claim 78, wherein the at least one beam pulse includes a plurality of beamlets, and wherein the first and second areas are irradiated by the beamlets.

97. The system according to claim 78, wherein the film sample is one of a silicon thin film sample and a metal thin film sample.

98. The system according to claim 78, wherein the thin film sample is composed of at least one of silicon, germanium, and a compound of silicon germanium.

99. The system according to claim 78, wherein the thin film has a thickness approximately between 100Å and 10,000Å.

100. The system according to claim 78, wherein the processing arrangement is further configured to:

(l) during procedure (b), mask portions of the at least one beam pulse to produce at least one masked beam pulse, wherein the at least one masked beam pulse is used to irradiate the at least one portion of the film sample in procedure (b).

101. The system according to claim 78, wherein the large grains provided in the first area are laterally-grown grains.

102. The system according to claim 101, wherein the laterally-grown grains of the first area are equiaxed grains.

103. A thin film sample, comprising:

at least one section irradiated by at least one beam pulse which fully melts the at least one section of the sample throughout its thickness,

wherein the at least one portion of the film sample is re-solidified to include a first area and a second area,

wherein, upon the re-solidification of the at least one section, the first area includes large grains, and the second area includes a region formed through nucleation,

wherein the first area surrounds the second area and has a grain structure which is different from a grain structure of the second area, and

wherein the second area is configured to facilitate thereon an active region of an electronic device.

104. A thin film sample, comprising:

a first area having large grains; and

a second area being surrounded by the first area and including a region formed through nucleation of at least one section of the thin film in which the second area is situated,

wherein the first area has a grain structure which is different from a grain structure of the second area, and

wherein the second area is configured to facilitate thereon an active region of an electronic device.